803 AGGREGATES

803.01 FINE AGGREGATE FOR PORTLAND CEMENT CONCRETE

Fine aggregates for portland cement concrete (other than lightweight aggregate) shall meet the size and quality requirements of AASHTO M 6 as modified herein. The weighted loss shall not exceed 12 percent by weight when the fine aggregate is subjected to 5 cycles of the magnesium sulfate soundness test.

To determine the degree of uniformity of the fine aggregate, fineness modulus (FM) determinations shall be made on representative samples from each source. Thereafter, if the fineness modulus varies by more than 0.20 from the value established on representative samples, the fine aggregate shall be rejected until suitable adjustments are made in the concrete proportions to compensate for the difference in grading.

Alkaline reactivity of fine aggregate shall be tested in accordance with AASHTO TP14, ASTM C 227 and C 289. Fine aggregate capable of producing a deleterious reaction when combined with Portland cement shall not be used in Portland cement concrete.

The amount of deleterious substances shall not exceed the following limits:

	Percent by Weight
Friable particles	1.0
Clay lumps	2.0
Coal and lignite	1.0
Materials passing the No. 200 sieve:	
(a) In concrete subject to surface abrasion	3.0
(b) All other classes of concrete	5.0
Other deleterious substances (such as shale, alkali, mica, coated grains, soft and flaky particles)	1.0

Chert, metaquartzite or a combination of both shall not exceed eight percent by weight per ASTM C295. Further examination under other tests is not required if content over eight percent.

Alkali-silica reactive constituents shall not exceed 0.05 percent expansion at six months per ASTM C227, and will be acceptable only when classified as innocuous per Figure 2, ASTM C289.

For alkali-carbonate reactive constituents, test specimen cylinders shall not exceed 0.08 percent expansion after 28 days immersion in a 1 N NaOH solution per ASTM C586.

Organic impurities shall produce a color not darker than Organic Plate No. 2 per AASHTO T21 or ASTM C40.

Fine aggregate for portland cement concrete shall be well graded from coarse to fine and when tested by means of laboratory sieves shall conform to the following requirements:

Sieve Designation	**Percent Passing by Weight**

3/8 inch (9.5 mm)	100
No. 4 (4.75 mm)	95-100
No. 16 (1.18 mm)	45-80
No. 50 (0.300 mm)	10-30
No. 100 (0.150 mm)	2-10

NOTE: In addition to the sieves specified above, the No. 8 and No. 30 sieves shall be used in order that the fineness modulus may be determined.

803.02 COARSE AGGREGATE FOR PORTLAND CEMENT CONCRETE

Coarse aggregate for portland cement concrete, (other than light-weight aggregates) shall consist of gravel, crushed gravel, crushed stone, crushed air-cooled blast furnace slag, crushed trap rock, or other approved inert materials of similar characteristics, or a combination thereof as specified, and shall meet the quality requirements of AASHTO M 80, and shall meet the size requirements of Table 803.02-1 for the grading specified. Material shall have a bulk dry specific gravity greater than 2.88 in order to be classified as trap rock as defined in ASTM C 294, Section 15.4.

Crushed stone or graded aggregate supplied from a quarry producing aggregates of asbestos bearing content or having asbestos present at the quarry are prohibited. Should such aggregates be utilized, both the Contractor and stone supplier will be directed to remove all asbestos bearing aggregates and replace them with non asbestos bearing aggregates. The Contractor and supplier shall further be liable for any and all consequential damages which may result as a violation of this requirement.

The percentage of wear as determined by the Los Angeles Abrasion Test shall not exceed 40. The weighted percentage of loss shall not exceed 15 percent by weight when the coarse aggregate is subjected to 5 cycles of the magnesium sulfate soundness test per AASHTO T 104.

The amount of deleterious substance shall not exceed the following limits:

	Percent by Weight
Soft Fragments	2.0
Coal and lignite	0.50
Chert (Less than 2.40 specific gravity SSD)	3.0
Clay lumps and clay coatings	0.25
Total material finer than No. 200 sieve (AASHTO T 11)	0.5
Material free of clay or shale	1.5
Thin or elongated pieces (length greater than 5 times the smallest dimension of a circumscribing rectangular prism)	15.0
Sum of clay lumps, friable particles and chert (Less than 2.40 Sp. Gr. SSD)	3.0
Other local deleterious substances	2.0

Chert, metaquartzite or a combination of both shall not exceed three percent by weight per ASTM C295 petrographic. Further examination under other tests is not required if content over three percent.

Alkali-silica reactive constituents shall not exceed 0.05 per cent expansion at six months per ASTM C277, and will be acceptable only when classified as innocuous per Figure 2, ASTM C289 and meet the criteria of AASHTO TP14.

For alkali-carbonate reactive constituents, test specimen cylinders shall not exceed 0.08 percent expansion after 28 days immersion in a 1 N NaOH solution per ASTM C586.

Organic impurities shall produce a color not darker than Organic Plate No. 1 per AASHTO T21 or ASTM C40.

After first dry sieving on the No. 200 sieve in accordance with AASHTO T 27, the adherent coating on coarse aggregate as tested in accordance with AASHTO T 11, with a wetting agent added to the wash water, shall not exceed 1 percent by weight.